MFT

PERSONAL FITNESS

Lesson 13

Personal Fitness: Lesson 13

- Review Lesson 12 and Homework
- LO #1: Requirements for Protein, Carbohydrate, Fat, H_2O and electrolyte replacement
- LO#2: Calculate your physical activity Vs. energy consumption profile
- LO#3: Theories, myths and truths about supplements
- Review

LO #1: Requirements for Protein, Carbohydrate, Fat, H_2O and electrolyte replacement

Why do you eat?

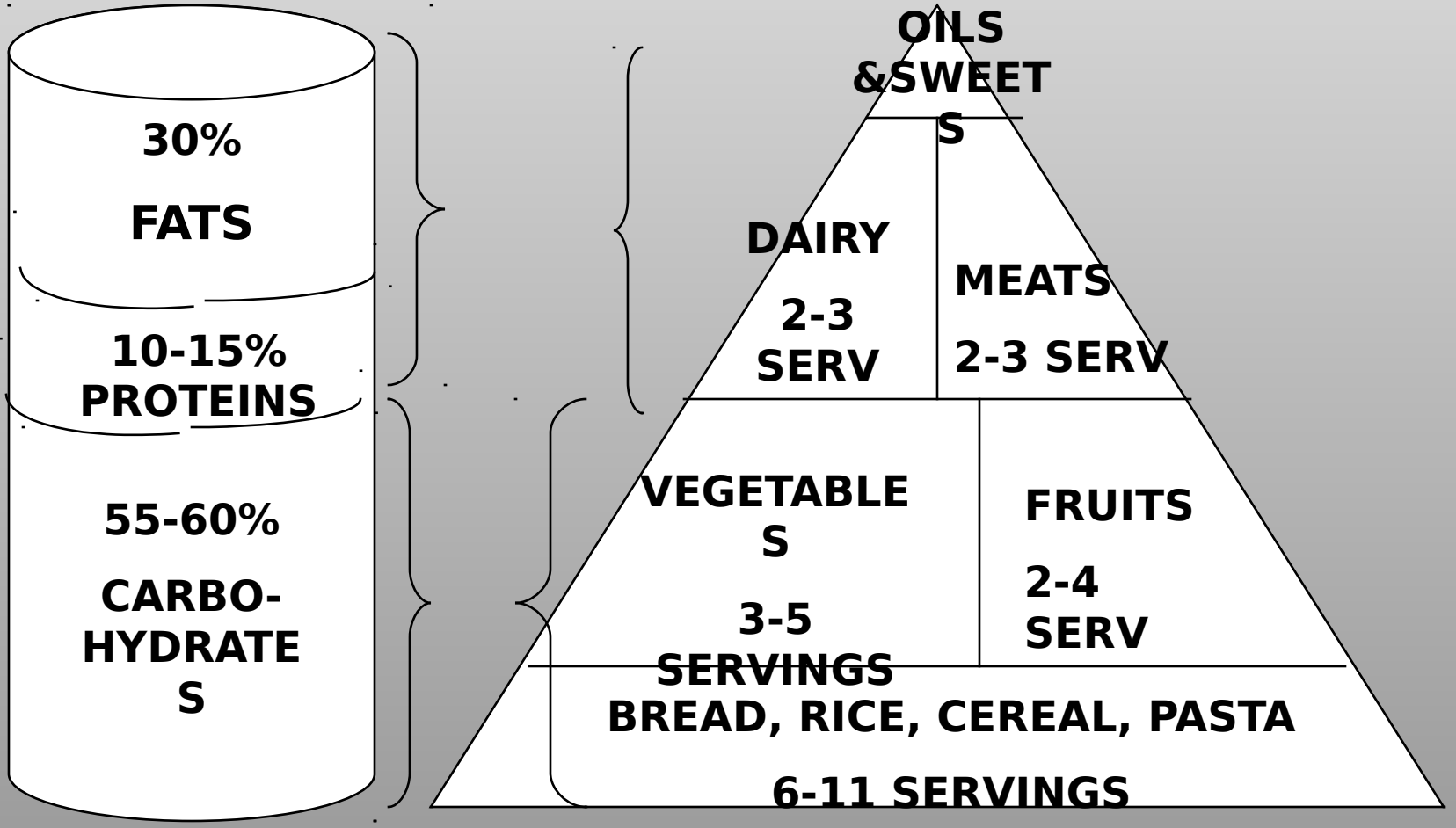
To supply the body with fuel and nutrients necessary for life and good health

The 6 categories of nutrients

Carbs	Fuel for Cells
Protein	Building Blocks for Cellular Repair
Fat	Insulation/Conduction of Nerve Signals
Minerals	Calcium for bone/teeth - chemical reactions
Vitamins	Chemical reactions / immune functions
Water	Solution that everything happens in / coolant

Fitness & Nutrition Link

THE NUTRITION PILLAR & PYRAMID



Carbohydrate intake – 5 critical times

1. 4 hours prior to activity
2. 1 hour prior to activity
3. 10 minutes before the start of the activity
4. During exercise
5. Within 2 hours post-exercise

4 hours prior to activity

- 4-5 grams/kg of body weight
- Example: 59kg woman or 77kg man = 295-385 grams of carbs
- Several acceptable forms of carbs
  - -juices
  - -glucose polymer
  - -solid carbs: fruits, starches

Carbohydrate guide

- Fruit exchange = 15g: apple/orange/4oz OJ
- Starch exchange = 15g: slice bread/.5 cup pasta/small baked potato
- Sports drinks = 15g per 7-8oz solution
- Sports bars = 20-50g: 1 PR bar/PowerBar
- Sports gels = 20-30g: 1 Power Gel/Gu/Clifshot

>1 Hour prior to activity

- 1-2 grams of carbs per kg of body weight
- Glucose polymers and foods w/ low glycemic index

  -High glycemic index foods can spike blood glucose

Glycemic index

High

Glucose
Fructose
Sucrose
Apple
Syrups-maple, corn, molasses
Applesauce
Honey
Cherries
Bagel
Candy
Peas
Corn Flakes
Carrots
Dates
Crackers
Figs
Potatoes
Peaches
Bread
Raisins

Medium

All bran cereal
Banana
Grapes
Oatmeal
OJ
Pasta
Rice
Whole grain Rye
Yams
Corn
Baked Beans
Potato Chips

Low

Beans
Chick
Lentils
Plums

10 Minutes Before Start of Activity

- For Strength Training

  - 50-60g of glucose polymer in a 40-50% solution (gel)

- For CR Training

  - Same, with a small amount of hydration

During Activity

- For Strength Training
  - 20g every 20 min. At a 5-10% solution
- For CR Training
  - Same, with:
    - hydration
    - electrolyte replacement (ie. Sodium)

Within 2 hours post-exercise

2 Protocols

1. 100-120g of carbs and 40g of protein
   - Foundation diet during next 24 hours
2. 1g of high glycemic index food per kg of body wt, consumed immediately after exercise and every 2 hours after, up to 6 hours
   - Move back to foundation diet

Exercise &...
Replacement of fluids

When	Quantity
2 hrs prior	2 cups
10-15 min	2 cups
During:	
every 15 min	.5-.75 cup
1-60 min after	2 cups per pound lost in exercise
Daily minimum	2 quarts per day

- active people need much more
- req’ts. increase in hot climates

Exercise &... vitamins, minerals, protein and fat

Facts:

1. Athletes perform better with lower % BF.
2. Strenuous exercise weakens immune system during recovery time. ("free radicals" or "oxidative stress")
3. Strenuous exercise causes tissue & fiber damage which requires repair.

Exercise &... vitamins & minerals

Vit B- enzymes for conversion of fat, protein & carbohydrate to energy

Vit A,C,E; zinc, copper, magnesium, selenium - bind with and eliminate free radicals, help immune system

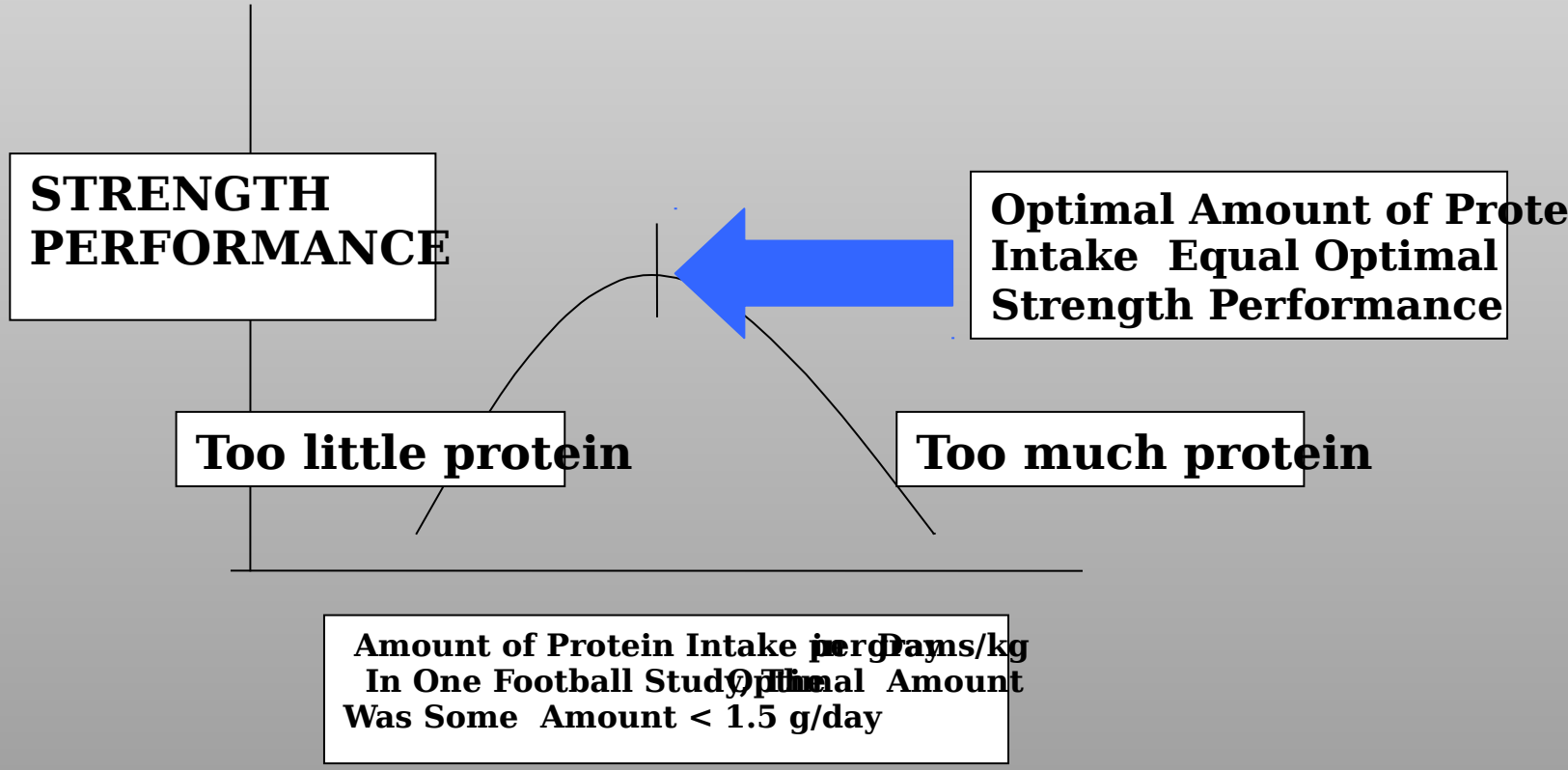
Iron - needed for RBC hemoglobin and O_2 transport

Vit D,C,K; calcium- required for healthy bones

Exercise &... protein and fat

- Protein-
  - general population:
    - 0.8 gm/kg body weight
    - 10-15% of total cal/day
  - athletes:
    - 1.2 - 1.75 gm/kg body weight
- Fat-
  - general population:
    - not more than 30% total cal/day
  - athletes:
    - 20-25% of total cal/day

Protein "Threshold Level"



LO#2: Calculate your physical activity Vs. energy consumption profile

Optimal diet calculations

1. Determine the protein requirements (athlete)
   - Body weight = 165lbs
   - 1.2g - 1.75 g/kg body wt
   - 2.2lbs = 1 kg

a. Body Wt (kg) = 165lbs/2.2 = 75 kg

b. Minimum protein (gm) = body wt x 1.2
   = 75 x 1.2 = 90 gm

c. Maximum protein (gm) = body wt x 1.75
   = 75 x 1.75 = 131 gm

Optimal diet calculations

2. Convert protein requirements into calories
   - range is 90 - 131 gm
   - 1gm protein = 4 calories

a. min protein cal = 90 protein gm x 4 cal/gm

= 360 calories

b. max protein cal = 131 protein gm x 4 cal/gm

= 524 calories

Optimal diet calculations

3. Determine total daily calorie requirements

Given: Optimal proportion of protein is 12%

a. min cal requirement:

if 360 cal protein = 12%

then X = 360 / .12 = 3000 cal

b. max cal requirement:

if 524 cal protein = 12%

then X = 524 / .12 = 4367 cal

Optimal diet calculations

4. Determine fat daily requirements in cal and gm
   - Given: athletes need about 25% of total cal/day
   - 9 calories per gram of fat

a. minimum fat cal = min total cal x 0.25

= 3000 cal x 0.25 = 750 cal

/ 9 = 83 gm

b. maximum fat cal = max total cal x 0.25

= 4367 cal x 0.25 = 1092 cal

/ 9 = 121 gm

Optimal diet calculations

5. Determine CHO daily requirements in cal & gm
   - Given: athletes need about 65% of total cal/day
   - 4 calories per gram carbohydrate

a. minimum CHO cal = min total cal x 0.65

= 3000 cal x 0.65 = 1950 cal

/ 4 = 487 gm

b. maximum CHO cal = max total cal x 0.65

= 4367 cal x 0.65 = 2838 cal

/ 4 = 710 gm

Estimating Resting Energy Expenditure

AGE in years	Equation
Males	
18-29	15.3 x body wt. + 679
30-60	11.6 x body wt. + 879
>60	13.5 x body wt. + 596
Females	
18-29	14.7 x body wt. + 496
30-60	8.7 x body wt. + 829
>60	10.5 x body wt. +596

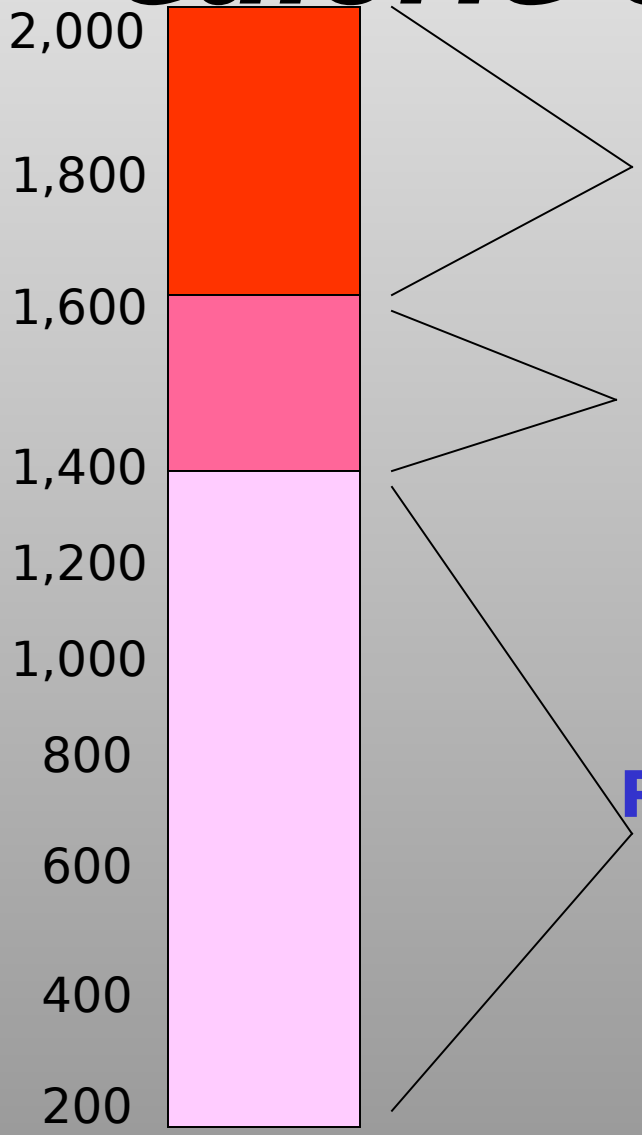
Example: 154 lb. Male, age 20
154 lbs/2.2 = 70kg
(15.3x70) + 679 = 1,750

***Body weight is measured in Kg**

Energy Expenditure

Level of Intensity Expenditure/minute	Caloric
Resting Metabolic Rate	1.0
Sitting and writing	2.0
Walking at 2 mph	3.3
Walking at 3 mph	4.2
Running at 5 mph	9.4
Running at 10 mph	18.8
Running at 15 mph	29.3
Running at 20 mph	38.7
Maximal power lifting	>90.0

Calorie expenditure



Thermal Effects of Exercise (T
(15-30%)

Thermal Effects of Food (TEF)
(5-10%)

Resting Energy Expenditure (R
(60-75%)

LO#3: Theories, myths and truths about supplements

Supplements

Why do we take them?

- **Men** - to increase muscle mass & performance

- **Women** - to improve health & nutrition

To Supplement or Not?

1. Do you eat breakfast 7 days a week?
2. Do you eat 3 meals a day, with 2 healthy snacks between?
3. Do you monitor your calorie consumption?
4. Do you restrict fat intake to 25% of your total diet?
5. Do you 60% of your calories come from carbohydrates? (mainly complex)
6. Do you eat from all 4 food groups? Do you eat 3-5 servings of fruit a day?
7. Do you eat at least 2 servings of vegetables a day?
8. Do you consume a well-balanced pre-game and post-game meal?

To Supplement or Not?

9. Do you consume a well-balanced pre-workout and post-workout meal?
10. Do you drink at least 2 quarts of water a day?
11. Do you get sufficient sleep at night and a 30 min power nap per day?
12. Do you use mental imagery to focus on performance?

The BLUF

- Many supplements lack longevity for scientific research
- Not well regulated
- They just don’t work (placebo effect)

Review

LO#1: ID physiological requirements for carbohydrate, H_2O and electrolyte replacement before, during and after exercise

LO#2: Physical activity vs energy consumption

LO#3: Nutritional supplements